ONTARIO. MINISTRY OF THE ENVIRONMENT

Township of South Sherbrooke. A municipal survey of the community of Maberly.

1977

TOWNSHIP OF SOUTH SHERBROOKE

A MUNICIPAL SURVEY

OF THE

COMMUNITY OF MABERLY

MUNICIPAL & PRIVATE ABATEMENT SECTION

SOUTHEASTERN REGION

1977

This Report Prepared By
D. Harrison, C.E.T.,
Environmental Officer.

TOWNSHIP OF SOUTH SHERBROOKE

A MUNICIPAL SURVEY

OF THE

COMMUNITY OF MABERLY

INDEX

TOWNSHIP OF SOUTH SHERBROOKE

A SURVEY OF THE SURFACE & GROUNDWATER CONDITIONS

IN THE

COMMUNITY OF MABERLY

1.0 Introduction

On August 4th, 1977, a municipal survey was undertaken in the Community of Maberly. Surveys of this nature are performed routinely by Ministry of Environment staff to assess existing individual services and to identify existing and potential sources of pollution.

The assistance and information received from the following persons and organizations is gratefully acknowledged:

Mrs. S.E. Deacon - Clerk-Treasurer, Township of South Sherbrooke.
Mr. J. Craig - Leeds, Grenville & Lanark District Health Unit.

2.0 Location and Description:

The Community of Maberly is situated on Highway #7 approximately 15 miles west of the Town of Perth. It has no municipal status or boundaries. There are no "wet" industries of any kind located in the community.

3.0 Topography:

All surface drainage from the community flows to the Fall River which passes through the centre of the village.

The topography is extremely rugged with a shallow overburden of sandy loam and numerous rock outcroppings.

4.0 Population:

The population of the Community of Maberly is about 125 persons. A recent subdivision proposal for six lots in the community may result in a slight increase in population if developed.

5.0 Existing Services:

The existing services are comprised of individual wells for water supply and individual systems for sewage disposal. Storm water drainage is handled by open ditches directed to the Fall River.

A breakdown of the types of wells and sewage disposal systems is shown in Table One.

6.0 Well Survey:

6.1 Sampling Procedures

On August 4th, 1977 an attempt was made to secure a bacteriological and chemical sample from every residence in the community. A total of 27 homes were sampled representing approximately 70% of the total wells. The bacteriological samples were transported to the Ministry of Health laboratory in Ottawa for examination. The chemical samples were shipped to the Ministry of Environment laboratory in Kingston for analysis. The locations of the sampled residences are shown on the appended map.

6.2 Bacteriological Results

The main reason for bacteriological testing is to determine if pathogenic bacteria; that is bacteria capable of causing a disease, are present in the well water. The presence of certain coliform organisms, which are not in themselves pathogenic, serve to indicate the possible presence of pathogenic bacteria. As noted in Table One, testing of the wells revealed that 20 (74%) were found to be satisfactory, 6 (22%) adverse and 1 (4%) doubtful. Each resident who had their well tested, and where the results were adverse or doubtful, was advised in writing to boil the drinking water until further notice. The bacteriological results and information on wells and sewage disposal systems are listed in Appendix I.

6.3 Discussion of Bacteriological Results

It should be noted that four of the six adverse results and the one doubtful result were from samples obtained from the dug wells. In general, dug wells are very susceptible to pollution from surface water and septic tank systems, particularly when the majority of dug wells are over 25 years old and are as shallow as those located in Maberly. The drilled wells that were found to contain bacteria are relatively shallow wells that were probably only cased to the bedrock and/or have not been fitted with proper sanitary seals.

TABLE ONE

WELL SURVEY RESULTS

COMMUNITY OF MABERLY

Residences Inspected	No.	% of Total Village
	35	70
Laboratory Results	**No.**	**% of Total Sampled**
Residences Sampled	27	-
* Satisfactory	20	74
** Doubtful	1	4
*** Adverse	6	22
Individual Method of Waste Disposal	**No.**	**% of Total Inspected**
Septic Tank & Tile Field	27	77
Privy	7	20
Cesspool	1	3
Individual Method of Water Supply	**No.**	**% of Total Inspected**
Drilled Wells	20	74
Dug Wells	6	22
Flowing	1	4

* Satisfactory - (Total Coliform = 0)
(Fecal Coliform = 0)
(Fecal Streptococci = 0)

** Doubtful - (Total Coliform = 4 or less)
(Fecal Coliform = 0)
(Fecal Streptococci = 0)

*** Adverse - (Total Coliform = 4 or more)
or (Fecal Coliform = present)
or (Fecal Streptococci = present)

6.4 Discussion of Chemical Results

The constituents commonly found in ground water that have a significant effect on domestic use were analysed for at the Ministry of Environment laboratory in Kingston. The concentrations of these chemicals are listed in Appendix II. The following is a breakdown of the significance and occurrence of these constituents:

Nitrates - are considered non-toxic to adults; however, for infants high levels in domestic water supplies do contribute to a condition known as infant methemoglobinemia (blue baby disease) in which the oxygen-carrying capacity of the blood is inhibited. Therefore a maximum acceptable level of 10 mg/l (milligrams per litre) as N has been established if the water is to be used for infant feeding. Since nitrates are present in relatively high concentrations in sewage, elevated nitrate levels in the well water can be considered as an indication of malfunctioning septic systems or faulty well construction. The analysis for nitrate revealed two wells with levels greater than the permissible 10 mg/l and 14 wells with elevated levels (greater than 1 mg/l). It should be noted that four of the six dug wells have elevated nitrate levels.

Chlorides - pose no direct health hazards; however, a water quality objective of 250 mg/l for domestic water supplies has been specified based on palatability requirements. Only one well was found to have chloride in a concentration greater than this objective. However, a number of wells located near the intersection of Highway #7 and County Road #5 have elevated chloride levels.

Hardness - measures the "soap consuming power" of a water due to the presence of metallic cations. Hard waters are objectionable because they form insoluble compounds with soap. This reaction reduces the efficiency of washing procedures and increases the cost of the washing process. The presence of high hardness in well waters has also been known to cause lime scale formations in plumbing fixtures. The majority of the wells sampled had hardness levels in the range of 200 - 600 mg/l and can be considered as being very hard.

Iron - is non-toxic at high levels but objectionable in domestic supplies because of the colour and bitter taste it imparts. The Ministry of Environment water quality objective for iron in domestic supplies is 0.3 mg/1. Five of the 27 samples analysed had iron concentrations greater than this objective. For the most part, the high iron was found in shallow drilled wells or dug wells. It is probable that the iron has been leached out of the overburden and/or that iron reducing bacteria have invaded these less protected water supply systems.

6.5 Summary of Well Survey Results

The conclusions reached upon reviewing the data collected during the survey are summarized as follows:

Four of the six adverse bacteriological examinations were made on water samples taken from dug wells. It can be concluded that since the majority of the dug wells are over 25 years old, they are in a poor state of repair and do not provide adequate protection for the water supply.

7.0 Provincial Subsidies:

The Ontario government, through the Ministry of the Environment, has established (October 1977) a program of grants to eligible municipalities to be applied to the cost of repair or renewal of private water and sewage systems in small communities.

Communities which apply for the grant will be assessed by the Ministry on the basis of possible health and environmental problems. Those municipalities which have an immediate problem will be given priority.

7.1 Who Qualifies

Small municipalities and resident groups in unorganized communities where ground conditions are satisfactory and where growth and the need for communal facilities is not of first importance.

7.2 Conditions for Grant

1) Grants will be made towards the cost of repair, or renewal, of systems serving homes that are principal residences in defined problem areas.

2) Grants may be considered for costs associated with systems for other dwellings, commercial buildings and small industries only when works are undertaken in conjunction with the resolution of defined problem areas amenable to a solution of this kind.

7.3 Assistance Available

The Province, through the Ministry of the Environment, will provide:

1) the cost of a consulting engineer's report to identify the problem, propose alternate solutions, and make recommendations;

2) up to 75 per cent of the construction costs that are in accordance with the recommended solutions approved by the Ministry. The 75 per cent assistance is net of any other government grants.

7.4 Procedures

1) Requests for project acceptance for new undertakings by municipalities are to be made in the form of a resolution of Council to the applicable regional office of the Ministry of the Environment.

2) The requests shall be considered for eligibility based on established criteria which define health and environmental considerations as the primary parameters for acceptance. Commitments based on available funds will be allocated, wherever possible, based on the Ministry's current "Management-by-Results" (MBR) system to establish priority of projects. (An MBR assessment system is utilized to evaluate priority of projects in terms of their contribution to achieve, in the following order of importance: the removal of health hazards, environmental protection, accommodation of growth, and community enhancement).

3) If the request is accepted, the Ministry will retain a consulting engineer to prepare a report to identify the problem and propose alternate solutions. Upon the

review of the report by the Ministry, the municipality shall be notified and the approval recommendation discussed.

4) Subject to the availability of funds, the amount of the grant based on the approved report will be committed to the municipality based on the fiscal year in which the construction is expected to take place. The funds may be made available over a two-year period.

7.5 Payment

- Up to 25 per cent of the total estimated cost of construction will be payable to the approved municipality in advance.
- The remaining portion of the grant will be payable on completion of the works or portion of the works in any fiscal year.
- The Ministry will require certified quarterly statements of costs, and all records substantiating such costs will be audited at the discretion of the Ministry.

8.0 River Survey:

8.1 Sampling Procedures

On August 4th, 1977, six chemical and six bacteriological samples were collected from the Fall River. The sampling locations are shown as A, B, C, D, E, F on the appended map. The results of the bacteriological examinations and chemical analyses are shown on Table Two.

8.2 Bacteriological Results

Ministry of the Environment microbiological criteria for water used for body contact recreational activities states that: where ingestion is probable, recreational waters can be considered impaired when the coliform, fecal coliform and/or enterococcus geometric mean density exceeds 1,000, 100 and/or 20 per 100 ml respectively, in a series of at least ten samples per month. Although the number of samples collected during the survey does not meet with the above

TABLE TWO

COMMUNITY OF MABERLY

RIVER SURVEY - AUGUST 4, 1977.

CHEMICAL RESULTS

	Sampling Location	BOD_5 mg/l	Suspended Solids mg/l	Total Lkeldahl as N	Total Phosphorus as P
A.	Fall River @ Highway 7	< 2	0.75	.45	.02
B.	Fall River @ Boat Dock	< 2	0.78	.54	.02
C.	Fall River @ Cty. Rd. #5	< 2	0.85	.61	.02
D.	Fall River, Downstream of Mill	< 2	0.67	.40	.02
E.	Fall River, Downstream of Twp. Hall	< 2	0.81	.15	.02
F.	Fall River, Downstream of Village	< 2	1.5	.45	.02

BACTERIOLOGICAL RESULTS

	Sampling Location	Total Coliforms /100 mls	Fecal Coliforms /100 mls	Fecal Streptococcus /100 mls
A.	Fall River @ Highway 7	215	30	20
B.	Fall River @ Boat Dock	170	64	15
C.	Fall River & Cty. Rd. #5	165	44	20
D.	Fall River, Downstream of Mill	210	24	200
E.	Fall River, Downstream of Twp. Hall	500	124	410
F.	Fall River, Below Village	500	114	150
	MOE standard for body contact recreation	1000	100	20

sampling criteria, the progressive increase in the numbers of fecal coliform and fecal streptococcus organisms observed when comparing upstream to downstream sampling locations reflect the effect of normal storm water drainage on a receiving stream.

8.3 Chemical Results

Chemical samples were taken at six locations on the Fall River and analysed for the following constituents: BOD_5, Suspended Solids, Total Kjeldahl Nitrogen, and Total Phosphorus. A comparison of each of the chemical concentrations was made between sampling locations and no overall change in water quality could be determined.

9.0 General Conclusions:

1. Bacteriological examinations of well water samples revealed that 20 (74%) were found to be satisfactory; 6 (22%) adverse and 1 (4%) doubtful.

2. Four of the six adverse bacteriological results were obtained from dug wells. This fact reflects the inability of older and probably deteriorated wells to provide the ground water supply with adequate protection.

3. The river sampling results indicate no overall change in chemical water quality. The increase in fecal streptococcus organisms reflect the effects of storm water drainage from the community.

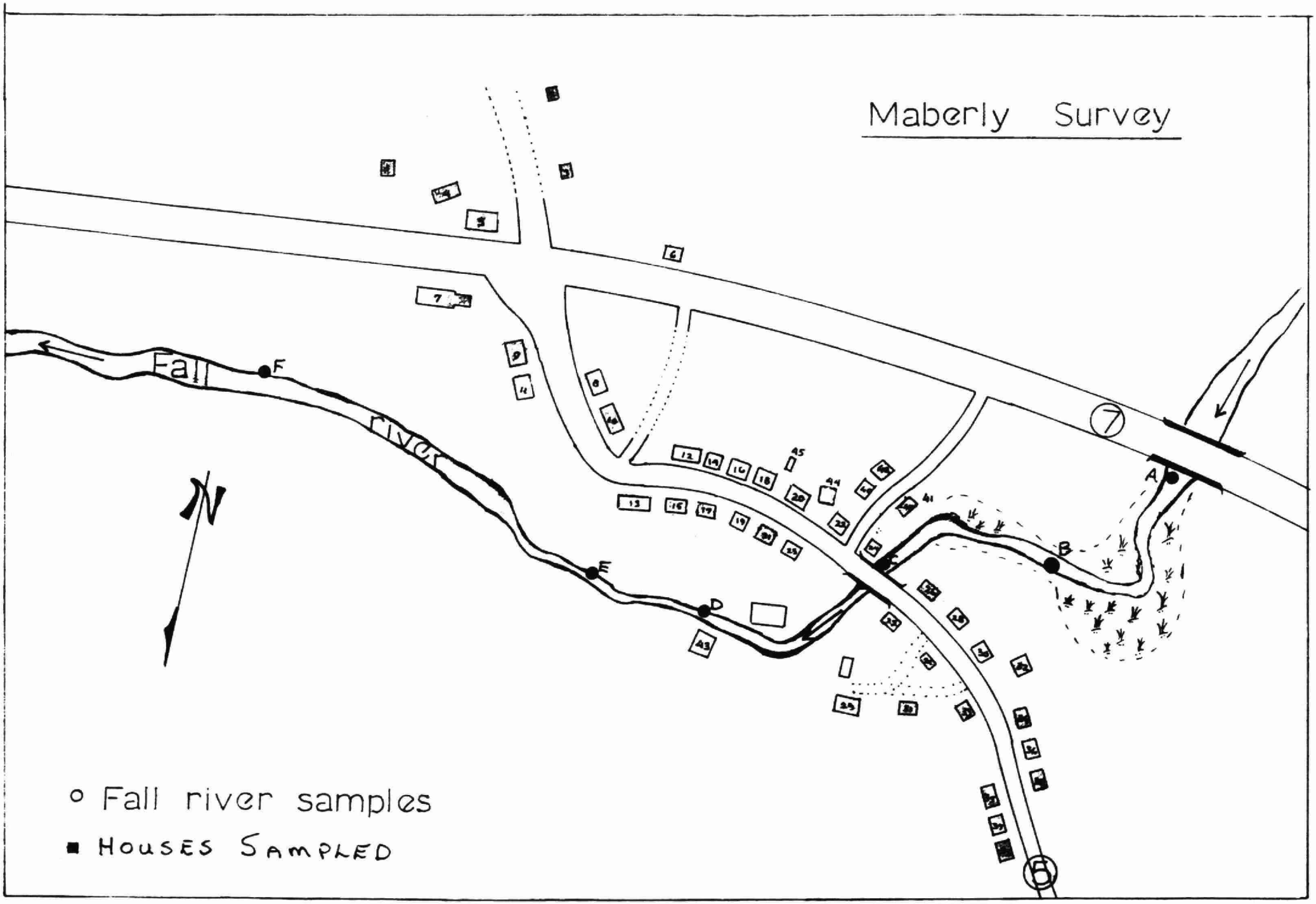
10.0 Recommendations:

It is recommended that:

1) Those persons whose wells have been found to be bacteriologically contaminated have them examined by a qualified person, such as a well driller or plumber, in order to ensure that surface water is not obtaining access to the well.

2) Those persons with bacteriologically and nitrate contaminated wells should contact the Leeds, Grenville & Lanark District Health Unit in order to ensure their sewage disposal systems are not malfunctioning.

3) Residents in the Community of Maberly should ensure that they continually sample their own water quality.


Maberly Survey
Fall
river
F
E
D
A
B
N
○ Fall river samples
■ HOUSES SAMPLED

APPENDIX I

MABERLY VILLAGE

MUNICIPAL SURVEY AUGUST 1977

Name	Sample No.	Coliform/100 ML Total	Coliform/100 ML Fecal	Fecal Strep.	Well Depth /Age	Sewage System /Age
C. Herns	1	0	0	6	- *	Septic Tank/3
W. Warwick	2	0	0	0	125/1	Septic Tank/1
H. Warwick	3	0	0	0	85/1	Septic Tank/1
D. Connate	4	16	0	16	- *	Septic Tank/
Fraser	5	0	0	0	80/25	Septic Tank/25
H. Moore	6	0	0	0	65/4	Septic Tank/4
Walker's well	7	30	0	0	-	Septic Tank/4
Walker spring	7s	6	0	0	-	Septic Tank/4
H. Palmer	9	80+	80+	80+	8/50*	Leaching Pit/50
E. Allan	10	0	0	0	34/3	Septic Tank/3
Twp. office	13	0	0	0	200/4	Septic Tank/2
W. Kirkham	14	0	0	0	215/1	Septic Tank/1
Twp. garage	15	uses 13's water supply			-	Septic Tank/5
J. Richard	17	0	0	0	60/26	Septic Tank/2
D. Myers	18	uses communal well			-	Pit Privy/moved every year
D. Tysick	20	0	0	0	215/4	Septic Tank/3
H. Fleming	21	0	0	0	60/11	Septic Tank/11
W. Greer	22	uses communal well			-	Pit Privy/moved every year
Bracegirdle	24	uses communal well			5/10*	Septic Tank/
H. Dowdall	25	uses communal well			-	Pit Privy
B. Nelson (communal well)	26	2	2	10	16/30*	Septic Tank/2
A. MacCharles	27	0	0	0	95/2	Pit Privy/6
J. Gordon	29	uses 31's water supply			-	Pit Privy/9
J. Antoine	31	0	0	0	365/4	Septic Tank/4
W. Cassidy	32	0	0	0	60/30	Septic Tank/7
R. Hill	33	0	0	0	180/	Septic Tank/6
H. Greer	34	0	0	6	73/1	Septic Tank/2
J. Ladoucer	35	2	2	0	80/5	Pit Privy/7
M. Duffy	36	uses 34's water supply				Septic Tank/15
G. Warrington	37	0	0	0	235/7	Septic Tank/

.....2

Maberly Village - Municipal Survey August 1977

Name	Sample No.	Coliform/100ML Total	Coliform/100ML Fecal	Fecal Strep.	Well Depth /Age	Sewage System /Age
E. Hearty	38	0	0	0	200/20	Septic Tank/4
J. Warrington	39	0	0	0	250/7	Septic Tank/7
C. Fleming (drilled)	42	0	0	0	55/7	Septic Tank/7
* C. Fleming (dug)	42d	2	0	-	/27	Septic Tank/7
B. Myers	45	uses 20's water supply				Pit Privy/moved every year

* Dug Well

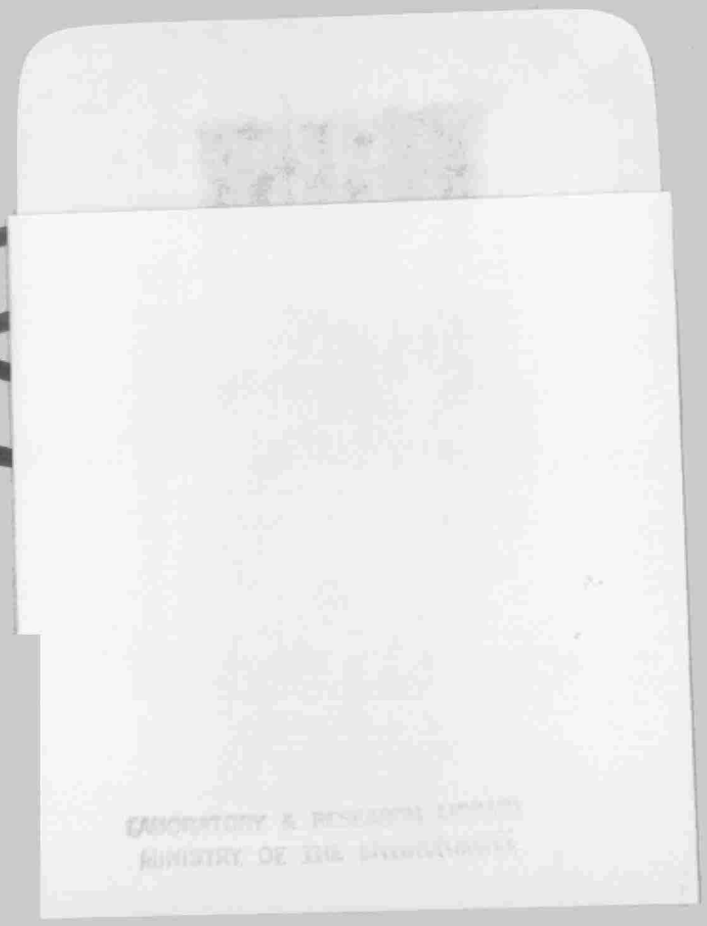
MABERLY VILLAGE

WELL SURVEY - AUGUST 1977

CHEMICAL RESULTS

Name		Hardness as CaCO3 /mg/1	Iron as Fe /mg/1	Chlorides as Cl /mg/1	Nitrate as N /mg/1
C. Herns	1*	300	<.05	74	1.62
W. Warwick	2	222	.10	3.0	< .02
H. Warwick	3	272	.10	2.7	< .02
D. Connate	4*	292	.25	213	.66
Fraser	5	152	<.05	11	.16
H. Moore	6	84	.05	2.0	.04
Walker (Well)	7	312	1.4	119	< .02
Walker (Spring)	7S	292	.45	138	.08
H. Palmer	9*	234	.45	41	5.6
E. Allen	10	500	3.8	250	< .02
Twp. Office	13	300	.15	61	1.7
W.D. Kirkham	14	612	.25	21	< .02
J. Richards	17	258	<.05	20	1.5
D. Tysick	20	388	.10	115	3.0
H. Flemming	21	264	<.05	13	.26
B. Nelson Communal Well	26*	348	.15	52	9.2
A. Mac Charles	27	228	.25	31	< .02
J. Antoine	31	244	<.05	3.7	12.8
W. Cassidy	32	384	<.05	122	4.8
R. Hill	33	276	<.05	22	3.2
H. Greek	34	420	<.05	71	9.0
J. Ladoucer	35	296	<.05	17	5.2
G. Warrington	37	210	< .05	8.0	1.2
E.C. Hearty	38	240	<.05	64	5.6
J. Warrington	39	610	.10	37	<.40
C. Flemming	42D*	142	.75	23	2.9

* Dug Well



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